REMARKS

In the Office Action dated August 13, 2002, the Examiner objects to claims 1 and 23. The Examiner rejects claims 1, 3-9 and 12-24 under 35 U.S.C. § 112, second paragraph. The Examiner rejects claims 1, 3-9 and 12-20 under 35 U.S.C. § 102(b) and claims 1, 3-5, 7, 14, 15, 23 and 24 under 35 U.S.C. § 102(e). Finally, the Examiner rejects claims 6, 9, 12, 13, 16-22 under 35 U.S.C. § 103(a). After entry of this Amendment, claims 1, 4-9 and 12-36 are pending in the application. In this Amendment, claims 1, 4-6, 8, 9, 12-18 and 21-24 have been amended, and claim 3 has been canceled without prejudice. Claims 25-36 have been added. It is respectfully submitted that the invention as defined by the claims is not anticipated or rendered obvious by the cited references taken singly or in any permissible combination. Reconsideration of the application as amended is respectfully requested.

The Applicants' counsel wishes to thank Examiner Markham for his courtesies during a telephonic interview conducted on December 12, 2002. Counsel initiated the interview to request clarification on the information required to respond to paragraph 21 of the Office Action. In the Office Action, the Examiner rejects claims 1, 3-5, 7, 14, 15, 23 and 24 under 35 U.S.C. § 102(e) as being anticipated by Vanden Brande et al. (US 6,099,667) and rejects claims 6, 9, 12, 13, and 16-22 under 35 U.S.C. § 103(a) as being unpatentable over Vanden Brande et al. alone or in combination with one or more of Baxter et al. (US 5,803,976), Behn et al. (US 4,301,765), and Kashiyawa et al. However, the foreign priority date for the instant application is October 6, 1997, which removes Vanden Brande et al. as prior art under 35 U.S.C. § 102(e)/103(a). In paragraph 21 of the Office Action, the Examiner indicates that the Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 C.F.R. 1.55.

During the interview, counsel indicated that the copy of the International Application as filed is the same as the original German application and that a Certificate of Translation was previously submitted in the instant case for the International Application. The Examiner indicated that this information should be sufficient to overcome the Vanden Brande et al. reference without the need for translating the document a second time. The Applicants respectfully submit that the copy of the International Application as filed on September 18, 1998

is the same application as the original German application dated October 6, 1997. An English translation of the International Application, and thus of the German application, along with a Certificate of Translation dated April 3, 2000, was submitted to the U.S. Patent and Trademark Office on April 6, 2000. It is respectfully requested that the Examiner withdraw the rejections under 35 U.S.C. § 102(e) based upon Vanden Brande et al. It is further submitted that since Vanden Brande et al. is not prior art to the present invention under any subsection of 35 U.S.C. § 102, it cannot be used as prior art in an obviousness rejection. Withdrawal of the Examiner's rejections to the claims under 35 U.S.C. § 103(a) based upon Vanden Brande et al. as a primary reference is also respectfully requested.

The Applicants have noted certain typographical and idiomatic errors in the specification as filed and have corrected these errors. It is respectfully submitted that these changes add no new matter to the application as filed. The Applicants have also incorporated a reference to the voltage source added to Fig. 1 and connected to the gas supply 3 as shown in the attached Request for Drawing Change Approval. It is respectfully submitted that this change, marked in red, merely makes the drawings conform to the specification and the claims and does not add new matter to the application. The Examiner's approval of the attached drawing change and the changes to the specification is respectfully requested.

The Examiner objects to claims 1 and 23 based upon a duplication of the phrase "a pulsed DC voltage." The Applicants have corrected this typographical error by removing the duplicate phrase in each claim.

The Examiner rejects claims 1, 3-9 and 12-24 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that the Applicants regard as the invention. Specifically, the Examiner states that it is unclear in claims 1, 14, 23 and 24 what range of AC voltage frequencies are encompassed by a "low" frequency, an "intermediate" frequency and a "high" frequency because they are not defined by the claim and the specification does not provide a standard for ascertaining the requisite degree and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is respectfully submitted that the specification describes at page 4 that a typical low-frequency AC voltage is between 50 Hz and 60 Hz, that a typical intermediate- (or mid-) frequency AC

voltage is between 10 kHz and 100 kHz and that a typical high-frequency AC voltage is between 1 MHz and 50 MHz. The Applicants also distinguish microwaves, signals in the gigahertz (GHz) range, from AC voltages, including high-frequency AC voltages.

It is respectfully submitted that this is a distinction that those of skill in the art would so make, especially given the teachings of the Applicants' specification. The Applicants have, however, made a change to claims 1 and 14 whereby the terms low-, intermediate- and high-frequency AC voltages have been replaced with the feature of an AC voltage having a frequency of up to 50 MHz. Support for this change is found in the specification at page 4 as previously described and in Exhibit 1, attached hereto, which includes pages 10-212 and 10-213 of the CRC Handbook of Chemistry and Physics, 79th Ed. (CRC Press 1998-1999). Microwave frequencies, as explained by the Applicants in the specification, start in the gigahertz range, scientifically at three GHz, according to the Handbook. Like other frequency bands, the outside ranges of the microwave frequencies can vary. For example, microwave ovens for private use generate a frequency of 2.45 GHz, below the scientifically-defined microwave band. However, this value is still far above a frequency of up to 50 MHz, which is just over the scientifically-defined HF-high frequency band (and just into the start of the VHF-very high frequency band). It is respectfully submitted that claims 1 and 14 and their dependent claims 4-9 and 12-22 are clear and definite and meet the requirements of 35 U.S.C. § 112, second paragraph. Claim 3 has been canceled without prejudice.

With respect to claims 23 and 24, the Applicants have amended these claims to indicate that the discharge is activated by at least one of a DC voltage, a pulsed DC voltage, an AC voltage and microwaves. The Applicants believe that it is unnecessary to distinguish between low-, intermediate- and high-frequency AC voltages as an electrical signal of any frequency, including one in the microwave range can be used to activate the hollow-cathode glow discharge according to the present invention either alone or in combination with another signal. In addition to the Examiner's rejection of claims 23 and 24 under 35 U.S.C. § 112, second paragraph, on this basis, the Examiner states that there is insufficient antecedent basis for "a plasma zone." As the Examiner is correct that the plasma zone is equivalent to the discharge region, the Applicants have changed this feature to "the discharge region." Finally, the Examiner states that the feature

starting with "integrating" in claim 23 is vague and indefinite as it is unclear what an element of the process is. The Applicants have clarified this feature to specify that the process occurs wherein all elements of the surface treatment process are integrated outside of the discharge region. It is respectfully submitted that claims 23 and 24 are clear and definite and meet the requirements of 35 U.S.C. § 112, second paragraph.

The Examiner rejects claim 1 and its dependent claims 3-9, 12 and 13 under 35 U.S.C. § 102(b) as being anticipated by Echizen et al. (US 5,527,391). The Examiner states that Echizen et al. teaches all of the features of claim 1 including the feature that Echizen et al. is activated by a high-frequency AC voltage in the form of a microwave. The Examiner also states that since the moving substrate confines the plasma discharge region to a hollow area, and that since the substrate may be directly used as an electrode for current passage, the substrate acts as a hollow cathode in the process of Echizen et al. The Examiner further states that Echizen et al. teaches all of the features of claims 3-9, 12 and 13, which depend from claim 1. Some additional clarifying changes have been made to claim 1 beyond those previously discussed. The restricting step is clarified to state that the process includes the step of restricting the discharge region on at least two opposite sides by surfaces to be treated, wherein the substrate surfaces are supplied by at least one substrate and form a hollow cathode used to enable a hollow-cathode glow discharge. Claim 3 has been canceled without prejudice, as previously mentioned. Each of claims 4-9, 12 and 13 have been amended to correct antecedent basis and to state elements so they are more clearly process steps, where appropriate.

It is respectfully submitted that Echizen et al. does not teach or suggest all of the features of claim 1. First, Echizen et al. fails to teach or suggest the activation of a hollow-cathode glow discharge only by at least one of a DC voltage, a pulsed DC voltage, and an AC voltage having a frequency of up to 50 MHz. As previously mentioned, Echizen et al. generates plasma using only microwaves. There is no suggestion or motivation to include any other source to generate plasma. In addition, while the moving substrate confines the plasma discharge region to a hollow area, the substrate does not act as a "hollow cathode" to enable a hollow-cathode glow discharge in the method of Echizen et al. To the contrary, in Echizen et al. includes a conventional bias electrode, which may be the substrate itself, to control the potential of the

plasma, which is generated by the microwave irradiation. (Echizen, et al., col. 25, ll. 8-10). Unlike in a hollow-cathode glow discharge, the band-shaped member 101 of Echizen et al. is not used to initiate plasma generation. The Examiner's reference to column 28, lines 58-61 as support for the use of the band-shaped member as an electrode for current passage does not support the Examiner's position that the substrate acts as a hollow cathode as known by those of skill in the art. This passage is irrelevant to the coating process itself. The passage, instead, describes the use of coated materials for solar cells. Solar cells need electrically conducting layers on their surface and backside. If solar cells are fabricated on a metallic substrate, the substrate can serve as an electrode for the solar electric current, i.e., "current passage" as described in Echizen et al.

Finally, the Applicants point out that a normal discharge is not covered by the present claims. The Examiner has argued that, read in light of the specification, a hollow-cathode discharge includes a discharge in the transition region between a hollow-cathode discharge and a normal discharge, so the claims read on Echizen et al. In addition to the other reasons stated above, Echizen et al. produces nothing more than a normal discharge; Echizen et al. would not produce any discharge in a region between a hollow-cathode discharge and a normal discharge because Echizen et al. does not produce a hollow-cathode discharge. In contrast, a hollow-cathode discharge as taught by the Applicants may produce some discharge in the transition region, but this does not include a normal discharge. For the foregoing reasons, the invention defined by claim 1 and its dependent claims 4-9, 12 and 13 is neither taught nor suggested by Echizen et al.

In addition to the foregoing, it is respectfully submitted that Echizen et al. fails to teach or suggest the features of claim 5. A minor correction to antecedent basis has been made in claim 5. Echizen et al. fails to teach the feature of claim 5 that the discharge region is restricted on at least one side by an area of the substrate before the turn in the direction of movement, and on at least one other side by an area of the substrate after the turn in the direction of movement. Although the band-shaped member 101 of Echizen et al. changes direction prior to and after the film-forming chamber 104 using the rollers 111 and 112, there are no changes in direction in the film-forming chamber 104 itself. The band-shaped member 101 travels in a constant cylindrical

path along the inside rings 113. Thus, in addition to the reasons set forth with respect to claim 1, from which it depends, claim 5 is allowable over the prior art of record.

The Examiner rejects claim 14 and its dependent claims 15-20 under 35 U.S.C. § 102(b) as being anticipated by Echizen et al., based on a discussion similar to that made with respect to claim 1. Claim 14 has been amended to as previously described and to make minor idiomatic changes. In addition, claim 14 has been clarified to state that an anode is placed proximate to the at least one substrate and is operable to receive an activating voltage to clarify its function and its location. Claim 14 also clarifies that it is the substrate surfaces that form a hollow cathode used to enable a hollow-cathode glow discharge. Dependent claims 15 to 18 have been amended to correct antecedent basis and to state elements so they are more clearly process steps. It is respectfully submitted that Echizen et al. does not teach all of the features of claim 14 as previously described with reference to claim 1. Specifically, Echizen et al. fails to teach or suggest the feature that the substrate surfaces form a hollow cathode used to enable a hollow-cathode glow discharge. Echizen et al. also fails to teach or suggest the feature of claim 12 that the discharge is activated an activating voltage, which is only at least one of a DC voltage, a pulsed DC voltage, and an AC voltage having a frequency of up to 50 MHz. For the foregoing reasons, claim 14 and its dependent claims 15-20 are allowable over the prior art of record.

The Examiner rejects claims 21 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Echizen et al. in view of Kashiyawa et al. (US 5,595,792). Each claim has been rearranged slightly for clarity and antecedent basis has been corrected to conform to claim 14. In addition, in claim 21, the deflection elements are described as being electrically isolated from the at least one substrate, without reference to the other device components. It is respectfully submitted that the combination of Echizen et al. and Kashiyawa et al. fail to teach or suggest all of the limitations of claims 21 and 22 because the combination fails to teach or suggest all of the features of claim 14, from which each depends. Further, it is respectfully submitted that it would not be obvious to include the masking plates 60 of Kashiyawa et al. in the device of Echizen et al. Kashiyawa et al. teaches that the three rolls 48 should be located as far as possible from the plasma stream so that film does not deposit and accumulate on the rolls 48. (Kashiyawa et al., col. 7, ll. 4-8). The masks 60 are thus arranged between the roll 48 and the plasma stream

23. (Kashiyawa et al., col. 7, ll. 9-13). Incorporating such a feature into Echizen et al. would not be feasible, as the inside rings 113 are directly supporting the band-shaped member 101 inside the film-forming chamber 104. Masks 60 would likely deflect deposition from a portion of the band-shaped member 101, even if there were space for such items in the design of Echizen et al. It is respectfully submitted that the combination cited by the Examiner fails to render the invention defined by either claim 21 or claim 22 obvious.

Upon withdrawal of the rejection to claims 23 and 24 based upon Vanden Brande et al., no rejections to these claims remain. However, the Applicants have taken this opportunity to more particularly point out and distinctly claim the invention. In claim 23, the preamble has been modified slightly to make it easier to read. In addition, the elements of the surface treatment process are integrated outside the discharge region have been specified for clarity. The elements include means for placing the gas in the region, means for removing the gas from the region, and means for activating the discharge. Finally, and as previously mentioned, the feature that the discharge can be activated by microwaves has been added. Similar changes have been made to claim 24. The preamble has been similarly clarified, and the discharge can be activated by microwaves. In addition, the substrate surfaces have additionally been identified as surfaces to be treated. The anode is now indicated as proximate to the at least one substrate instead of placed in the region of the at least one substrate to eliminate any confusion with regard to the antecedent basis of the region. Finally, elements of the device integrated outside the plasma zone have been explicitly listed, namely the means for supplying electrical energy, the means for supplying gas, the means for removing gas and the anode. It is respectfully submitted that the claims as amended still include subject matter that the Examiner found allowable over the prior art, and specifically Echizen et al. Echizen et al. teaches a dielectric tube 203 and a central conductor 202 of a coaxial cable, in addition to a bias applicator tube for the provision of starting gas 206 in the area where the band-shaped member 201 is treated. It is therefore respectfully submitted that claims 23 and 24 are allowable over the prior art of record.

With this Amendment, new claims 25-36 have been added. Claims 25 to 27 depend from claim 1 and add additional features neither taught nor suggested by Echizen et al. Claim 25 teaches that the discharge region is restricted on two sides by substrate surfaces at a

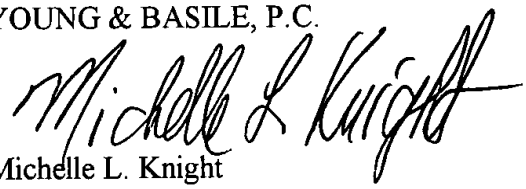
distance of one to ten centimeters apart. Claim 26 teaches that the hollow-cathode glow discharge is activated by one of a DC voltage, a pulsed DC voltage with a pulse frequency between ten kHz and 100 kHz, an AC voltage having a frequency between 50 Hz and 60 Hz, an AC voltage having a frequency between ten kHz and 100 kHz and an AC voltage having a frequency between one MHz and 50 MHz. Finally, claim 27 teaches that the at least one substrate comprises at least one band-shaped substrate and wherein the restricting step further comprises restricting the discharge region on two opposed, parallel sides by the at least one band-shaped substrate. Claims 28 to 31 depend from claim 14. Claims 28 to 30 teach features similar to those in claims 25 to 27. Claim 31 depends from claim 30 and includes the additional feature of at least one roller located outside the discharge region and supporting the at least one band-shaped substrate. Claim 32 depends from claim 23 and claim 33 depends from claim 32. Claims 32 and 33 include features similar to those described respectively in claims 30 and 31. Claims 34 and 35 depend from claim 24 and include features similar to those described in claims 29 and 30. Claim 36 depends from claim 35 and includes an additional feature similar to that in claim 31. It is respectfully submitted that the invention as defined by each of claims 25-36 includes new and non-obvious features and is thus patentable over the prior art of record.

It is respectfully submitted that this Amendment traverses and overcomes all of the Examiner's objections and rejections to the application as originally filed. It is further submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. Reconsideration of the application as amended is requested. It is respectfully submitted that this Amendment places the application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicants' attorney at the telephone number listed below.

Respectfully submitted,

YOUNG & BASILE, P.C.



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Please replace the fifth full paragraph on page 2, starting at line 25, with the following paragraph:

The restriction of the discharge region occurs preferably on at least two essentially opposite sides, and can be, for example, in the form of a cylinder or prism with a round or polygonal cross section, depending on the shape of the substrate to be coated. It is also especially appropriate to enclose [it] the discharge region between two flat substrates arranged parallel to one another. Regardless of the shape of the enclosure, the distance between the opposite surfaces in each case should be about [1] one mm to 50 cm, preferably [1] one cm to [10] ten cm.

Please replace the first and second full paragraphs on page 3, starting at line 3, with the following paragraphs:

Especially advantageous is the surface treatment of one or more band-shaped substrates, which are turned while changing their direction of movement at least once[and]. The substrates restrict the discharge region, at least on the one hand, by means of a surface region that lies before the turn in the direction of the band movement, and one the other hand, by means of a surface region that lies after the turn in the direction of the band movement. In this way, the surfaces of the band-shaped substrate to be treated pass the discharge zone at least twice each time the band is fed. A surface treatment made much more intense in this way permits an advantageous increase in the rate of movement.

The electric discharge preferably involves a discharge in the region of the hollow-cathode discharge. By this, according to the invention, it is also understood to mean a discharge in the transition region between hollow-cathode discharge and normal discharge. The entire substrate, which can be at ground potential, thereby forms the cathode. An anode, which is as a positive potential with respect to ground, is located as a counter-electrode in an appropriately selected site in the apparatus, preferable at the edge of the gas discharge. Even with a microwave-activated discharge, a hollow-cathode discharge can be constructed. The plasma then forms a "virtual" anode.

Please replace the last full paragraph on page 4, starting at line 25, with the following paragraph:

Substrate 1 can be grounded or connected to the ungrounded output of a voltage source such as that shown in Fig. 1. The voltage between substrate and a plasma formed by the electric discharge is preferably between [1] one volt (V) and 3000 V, more preferably, between 100 V and 1000 V. Pulsed DC voltages with a pulse frequency between [10] ten kHz and 100 kHz can also be considered as DC voltages. When low-frequency AC voltages are used, the frequency is preferably between 50 Hz and 60 Hz, and with intermediate-frequency AC voltages preferably between [10] ten kHz and 100 kHz. High-frequency AC voltages preferably have frequencies between [1] one MHz and 50 MHz. Instead of, or in addition to, supplying power with a voltage source, it can also be supplied by microwaves. The microwave frequencies are preferably in the [GHz] gigahertz (GHz) range.

In the claims:

1. (Three times amended) A process for surface treatment of at least one electrically conducting substrate or a substrate that has been coated so as to be electrically conducting, the process comprising the steps of:

placing a gas in a region of an electric discharge;

restricting the discharge region on at least two opposite sides by surfaces to be treated, wherein the [one or more substrates] substrate surfaces are supplied by at least one substrate and form a hollow cathode used to enable a hollow-cathode glow discharge; and

treating the substrate surfaces by a hollow-cathode glow discharge, said discharge activated only by at least one of a DC voltage, a pulsed DC voltage, [a pulsed DC voltage or a low-, intermediate-, or high-frequency] and an AC voltage having a frequency of up to 50 MHz.

Please cancel claim 3 without prejudice.

4. (Three times amended) The process according to claim 1 wherein the [substrates are] at least one substrate is band-shaped.

5. (Three times amended) The process according to claim [3] 4 further comprising the step of:

turning the at least one [of the substrates] substrate at least once to change the direction of movement;

wherein the discharge region is restricted on at least one side by an area of the substrate before the turn in the direction of movement, and on at least one other side by an area of the substrate after the turn in the direction of movement.

6. (Three times amended) The process according to claim 1 wherein the restricting step further comprises the step of restricting the discharge region [is restricted] on two sides by substrate surfaces at a distance of [1] one mm to 50 cm apart.

8. (Three times amended) The process according to claim 1 wherein the at least one substrate is grounded.

9. (Three times amended) The process according to claim 1 wherein [the] a magnitude of a voltage applied between the at least one substrate and a plasma formed by said electric discharge is [1 V -] between one and 3000 [V] volts.

12. (Three times amended) The process according to claim 1 wherein the placing step further comprises the step of feeding the gas [is fed] into one of the discharge region and an area immediately outside the discharge region.

13. (Three times amended) The process according to claim 1 [wherein] further comprising the step of removing the gas [is removed] from one of the discharge region and an area immediately outside the discharge region.

14. (Three times amended) A device for surface treatment of at least one electrically conducting substrate or a substrate that has been coated so as to be electrically conducting, the device comprising:

[at least one substrate defining] a discharge region enclosed on at least two sides by substrate surfaces of at least one substrate;

means for supplying electrical energy to the discharge region;

a vacuum chamber to enclose the discharge region;

means for supplying gas to the vacuum chamber;

means for removing gas from the vacuum chamber; and

an anode placed [in the region of] proximate to the at least one substrate and is operable to receive an activating voltage;

wherein the [at least one] substrate [forms] surfaces form a hollow cathode used to enable a hollow-cathode glow discharge, and wherein the at least one substrate is surface treated by [a] the hollow-cathode glow discharge, said discharge activated [only] by the activating voltage, the activating voltage only at least one of a DC voltage, a pulsed DC voltage, [or a low-, intermediate-, or high-frequency] and an AC voltage having a frequency of up to 50 MHz.

15. (Twice amended) The device according to claim 14 [wherein substrate-cooling is provided] further comprising means for cooling the at least one substrate.

16. (Three times amended) The device according to claim 14 [wherein] further comprising a gas supply [is] arranged in one of the discharge region and immediately outside the discharge region.

17. (Three times amended) The device according to claim 14 [wherein] further comprising means for gas removal [is] arranged in one of the discharge region and immediately outside the discharge region.

18. (Three times amended) The device according to claim 14 wherein the at least one substrate is a continuously running band adapted to be unwound from a first spool and adapted to be wound onto a second spool.

21. (Three times amended) The device according to claim 14 [wherein] further comprising deflection elements arranged in the vacuum chamber, in the region of the sides of the discharge region not restricted by the substrate surfaces, wherein the deflection elements [are arranged that] are electrically isolated from the [device components and] at least one substrate.

22. (Three times amended) The device according to claim 14 [wherein] further comprising deflection elements arranged in the vacuum chamber[, deflection elements are arranged in the regions of] near one of the device components in which parasitic discharges could be formed due to their potentials[, or around] and the at least one substrate and the discharge region, and wherein [these] the deflection elements are electrically isolated from the device components and the at least one substrate.

23. (Amended) A process for surface treatment of [at least] a substrate, the substrate one of an electrically conducting substrate [or] and a substrate [that has been] coated so as to be electrically conducting, the process comprising the steps of:

placing a gas in a region of an electric discharge;

restricting the discharge region on at least two [opposite] sides by substrate surfaces to be treated, wherein the [one or more substrates] substrate surfaces form a hollow cathode; and

treating the substrate surfaces by a hollow-cathode glow discharge, said discharge activated by at least one of a DC voltage, a pulsed DC voltage, [a pulsed DC voltage or a] an [low-frequency, intermediate-, or high-frequency] AC voltage and microwaves; and wherein

[integrating all] elements of the surface treatment process are integrated outside of [a plasma zone] the discharge region, the elements including means for placing the gas in the region, means for removing the gas from the region, and means for activating said discharge.

24. (Amended) A device for surface treatment of [at least] a substrate, the substrate one of an electrically conducting substrate [or] and a substrate [that has been] coated so as to be electrically conducting, the device comprising:

at least one substrate defining a discharge region enclosed on at least two sides by substrate surfaces to be treated;

means for supplying electrical energy to the discharge region;

a vacuum chamber to enclose the discharge region;

means for supplying gas to the vacuum chamber;

means for removing gas from the vacuum chamber; and

an anode [placed in the region of] proximate to the at least one substrate;

wherein the [at least one substrate forms] substrate surfaces form a hollow cathode, and wherein the [at least one substrate is] substrate surfaces are surface treated by a hollow-cathode glow discharge activated by at least one of a DC voltage, a pulsed DC voltage, [or a low-, intermediate-, or high-frequency] an AC voltage and microwaves; and

wherein [all] elements of said device are integrated outside of [a plasma zone] the discharge region, the elements including the means for supplying electrical energy, the means for supplying gas, the means for removing gas and the anode.

Claims 25-36 have been added.